ISSN 0146-8030
Volume 14 1995

FIBER AND INTEGRATED OPTICS

FIBER AND INTEGRATED OPTICS

EDITOR-IN-CHIEF

Henri Hodara
Tetra Tech Data Systems Inc.
San Diego, CA

MANAGING EDITOR

Donna Casarez
Tetra Tech Data Systems Inc.
San Diego, CA

EXECUTIVE BOARD

José Capmany
ETSI Telecomunicación
Valencia, Spain

Yun C. Chung
Korea Advanced Institute of Science and Technology (KAIST)
Taejon, South Korea

Bruno Crosignani
University of Rome
Rome, Italy

Julio Escobar
BBN Systems and Technologies
Cambridge, MA

Huang Hung-chia
Shanghai University of Science and Technology
Shanghai, China

Anis Husain
Advanced Research Projects Agency
USA

Gordon Mitchell
Future Focus
Woodinville, WA

Charles P. Sandbank
Department of Trade and Industry
London, UK

G. M. Stephan
ENSSAT
France

Shuzo Suzuki
Sumitomo Electric Industries, Ltd.
Yokohoma, Japan

ADVISORY BOARD

Aharon Agranat
Hebrew University of Jerusalem
Israel

Venkata Bhagavatula
Corning Incorporated
Corning, NY

Giancarlo de Marchis
Fondazione ugo Bordoni
Rome, Italy

H. Ghafouri-Shiraz
University of Birmingham
Birmingham, UK

Ilan Gravè
University of Pittsburgh
Pittsburgh, PA

Lynn Hutcheson
Raynet Corporation
Menlo Park, CA

Reinhard Marz
Siemens AG
Munchen, Germany

Miguel A. Muriel
Universidad Politecnica de Madrid
Madrid, Spain

Motoichi Ohtsu
Tokyo Institute of Technology
Yokohoma, Japan

John O'Reilly
University of Wales
Wales, UK

Paul Polishuk
Information Gatekeepers, Inc.
Boston, MA

Jacek Sochaki
Central Laboratory for Optics
Warsaw, Poland

Chen Tsai
University of California
Irvine, CA

V. W. Zuev
Institute of Atmospheric Optics
Academy of Sciences
Tomsk, Russia

Abstracted and / or Indexed in: Automatic Subject Citation Alert; Chemical Abstracts Service; Current Contents / Engineering Technology & Applied Sciences; Electrical and Electronics Abstracts; Engineering Index; Engineering Information; Engineering Materials Abstracts; Journal of Current Laser Abstracts; Laser Focus; Materials Science Citation Index; Physics Abstracts; Science Research Abstracts, Part B.

Editorial Office: Henri Hodara, Tetra Tech Data Systems Inc., 2451A Impala Drive, Carlsbad, CA 92008.

Publishing, Advertising, and Production Offices: Taylor & Francis, 1101 Vermont Ave., NW, Suite 200, Washington, DC 20005, phone (202) 289-2174, fax (202) 289-3665, Joyce A. Evans, Production Editor; or Taylor & Francis Ltd., Rankine Rd., Basingstoke, Hampshire RG24 8PR, UK. **Subscriptions Office:** 1900 Frost Rd., Suite 101, Bristol, PA 19007; phone (215) 785-5800, fax (215) 785-5515; or Taylor & Francis Ltd., Rankine Rd., Basingstoke, Hampshire RG24 8PR, UK, phone +44-256-840366, fax +44-256-479438.

Fiber & Integrated Optics (ISSN 0146-8030) is published quarterly by Taylor & Francis Ltd., 4 John Street, London WC1N 2ET, UK. Annual 1995 subscription rate (Volume 14) UK £121, US $200. Personal subscription rate UK £60, US $99; available to home address only and must be paid for by personal check or credit card.

Second-class postage rates paid at Jamaica, NY 11431. U.S. Postmaster: Send address changes to Fiber & Integrated Optics, Publications Expediting, Inc., 200 Meacham Avenue, Elmont, NY 11003. Airfreight and mailing in the USA by Publications Expediting, Inc., 200 Meacham Avenue, Elmont, NY 11003.

Dollar rates apply to subscribers in all countries except the UK and the Republic of Ireland, where the sterling price applies. All subscriptions are payable in advance and all rates include postage. Journals are sent by air to the USA, Canada, Mexico, India, Japan, and Australasia at no extra cost. Subscriptions are entered on an annual basis, i.e., January to December. Payment may be made by sterling check, dollar check, international money order, National Giro, or credit card (AMEX, VISA, Mastercard / Access).

Orders originating in the following territories should be sent directly to: **India** – Universal Subscription Agency Pvt. Ltd., 101-102 Community Centre, Malviya Nagar Extn., Post Bag No. 8 Saket, New Delhi; **Japan** – Kinokuniya Company Ltd., Journal Department, P. O. Box 55, Chitose, Tokyo 156; **USA, Canada, and Mexico** – Taylor & Francis, Inc., 1900 Frost Road, Suite 101, Bristol PA 19007, USA; **UK and all other territories** – Taylor & Francis Ltd., Rankine Road, Basingstoke, Hampshire RG24 8PR, UK.

Copyright:
The appearance of the code at the top of the first page of each article in this journal indicates the copyright owner's consent that a single copy of the article may be made for personal use. This consent is given on the condition that for multiple copies of the article the copier pay a fee of $10.00 per copy through the Copyright Clearance Center, Inc., 27 Congress Street, Salem, MA 01970. This consent does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale. No part of this publication may be stored on an electronic retrieval system or transmitted electronically without the prior written permission of the publisher. Authors are responsible for obtaining permission to reproduce copyrighted material from other sources and are required to sign an agreement for the transfer of copyright to the publisher.

The publisher assumes no responsibility for any statements of fact or opinion expressed in the published papers. The appearance of advertising in this journal does not constitute an endorsement or approval by the publisher, the editor, or the editorial board of the quality or value of the product advertised or of the claims made for it by its manufacturer.

♾ Printed on acid-free paper, effective with Volume 11, Number 1, 1992.

Copyright © 1995 Taylor & Francis

Printed by Burgess Science Press, Basingstoke, England

FIBER AND INTEGRATED OPTICS

Volume 14, Number 1
1995

Special Issue
Optical Network Switching Technology

Guest Editors: Julio Escobar, Carl M. Verber, and Jon Sauer

Contents

Foreword iii

Low Crosstalk Monolithic Wavelength Demultiplexing Switch Arrays
M. Selim Ünlü 1

Time-Wavelength Assignment Algorithms: Hardware/Performance Tradeoffs
Aura Ganz and Yavuz Varoglu 15

Multiaccess in All-Optical Networks with Wavelength and Code Concurrency
Murat Azizoglu and Ahmed Mokhtar 37

Virtual Topology Design of Shared Channel Lightwave Networks
Aura Ganz and Xudong Wang 53

250-Gb/s Self-Clocked Optical TDM with a Polarization-Multiplexed Clock
I. Glesk and P. R. Prucnal 71

Remote All-Optical Nanosecond Gain Switching of an Erbium-Doped Fiber Amplifier
P. Myslinski, C. W. Barnard, and J. Chrostowski 83

Review of the Basic Methods for Characterizing Integrated-Optic Waveguides
S. I. Hosain, J. P. Meunier, E. Bourillot, F. de Fornel, and J. P. Goudonnet 89

FIBER AND INTEGRATED OPTICS

Volume 14, Number 2
1995

Contents

Comparison of the Performance of Optical Systems in Fiber Links 4000 km Long
F. Matera and M. Settembre 109

Superimposed Microwave Modulation at Two Times the Bit Frequency: Characteristics and Performance in Gbps Systems
C. Michael Olsen and Daniel M. Kuchta 121

Single-Mode SiON/SiO_2/Si Optical Waveguides Prepared by Plasma-Enhanced Chemical Vapor Deposition
Yuan-Kuang Tu, Jung-Chuan Chou, and Shiang-Ping Cheng 133

Refined Modeling of Traveling-Wave Ti:$LiNbO_3$ Channel Waveguide Modulator
A. d'Alessandro, A. D'Orazio, M. De Sario, V. Petruzzelli, and F. Prudenzano 141

Shaft Runout Inspection by a Fiber Optic Displacement Sensor
Haiming Wang and Ricardo Valdivia-Hernandez 159

Gas Sensor Response Time Analysis for Tapered Porous-Clad Fibers
C. D. Singh and B. D. Gupta 171

Stimulated Four-Photon Mixing and Efficient Polychromatic Visible Light Generation in SiO_2-Based Single-Mode Optical Fibers Pumped at 1.319 μm
Ana M. Reis, Marcos V. D. Vermelho, Dário L. Nicácio, Evandro A. Gouveia, and Artur S. Gouveia-Neto 179

FIBER AND INTEGRATED OPTICS

Volume 14, Number 3
1995

Special Issue
Fiber Resonators

Guest Editors: José Capmany, Y. H. Ja, and M. A. Muriel

Contents

Introduction to the Special Issue iii

Ring Resonators with $N \times M$ Couplers
Duncan L. MacFarlane, Eric M. Dowling, and Vishwa Narayan 195

Dynamic Response of High-Resolution Ring Resonator Optical Spectrometers to Time-Varying Input Signals
Kyriacos Kalli and David A. Jackson 211

Vernier Operation of Fiber Ring and Loop Resonators
Y. H. Ja 225

Theory of Integrated Ring Resonators Using Electro-Optical Couplers
José Capmany, Javier Martí, Salvador Sales, Daniel Pastor, and Joaquín Cascón 245

Fiber Optic Sensor Based on a Sagnac Interferometer Including a Recirculating-Ring Delay Line with an EDFA
J. T. Kringlebotn, K. Bløtekjær, and C. N. Pannell 265

Quantum Noise Analysis of an Amplifying TCRR Using a Continuous-Modes Formalism
David J. Santos, Rafael Gómez-Alcalá, Francisco J. Fraile-Peláez, and Miguel Prol 287

FIBER AND INTEGRATED OPTICS

Volume 14, Number 4
1995

Special Issue
Fiber Resonators

Guest Editors: José Capmany, Y. H. Ja, and M. A. Muriel

Contents

Introduction to the Special Issue iii

Dynamic Path Length Changes in All-Fiber Mirrors: Transmission Modulation
J. L. Cruz and M. V. Andres 295

Investigation and Applications of All-Fiber Brillouin Ring Resonator Lasers
Kyriacos Kalli and David A. Jackson 303

Instability and Chaos in a Two-Coupler Fiber Ring Resonator
Miguel Prol, F. Javier Fraile-Peláez, Rafael Gómez-Alcalá, Pedro Chamorro-Posada, and David J. Santos 331

Optical Bistability and Temporal Symmetry-Breaking Instability in Nonlinear Fiber Resonators
Jorge García-Mateos, Fernando Canal Bienzobas, and Marc Haelterman 337

Performance Parameters and Applications of a Modified Amplified Recirculating Delay Line
Carmen Vázquez, Manuel López-Amo, Miguel A. Muriel, and José Capmany 347

Theory of a FIR Optical Digital Differentiator
Nam Q. Ngo and Le N. Binh 359

Following page 386:

Title Page to Volume 14
Contents of Volume 14
Author Index to Volume 14